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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/670,857
Filing Date: September 25, 2003
Appellant(s): MARATHE, SAMEER S.

Andrew J. Ririe
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed June 18, 2007 appealing from the Office action mailed October 27, 2005.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

3,923,344	Sekigawa et al.	12-1975
5,445,441	Inagawa et al.	8-1995
6,132,012	Ishii	10-2000
6,494,545	Nakamura et al.	12-2002
6,595,598	Harris et al.	7-2003
6,669,311	Holst et al.	12-2003
6,679,564	Nitta et al.	1-2004

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1,10,15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishii in view of Nitta et al. and Nakamura et al.

Regarding claims 1,10 as broadly claimed, Ishii discloses a monitoring apparatus for a brake system comprising a pressure detection device 11 for detecting the pressure in an accumulator 7 (inherently having a pre-charge pressure) and a monitoring device

13. Note also the functioning of the pressure gradient calculating means 21 (see bottom of col. 8). As discussed in column 9 lines 17+ "If the gradient of pressure depression is larger than the set value (beta), the pressure in the accumulator 7 cannot normally be lowered. Thus, a determination is made that an abnormal condition has been encountered (in many cases, an abnormal condition such as leakage of solution in the accumulator 7). Similarly if a case in which the gradient of pressure depression is larger than the set value (beta) is *sequentially occurs predetermined number of times*, an abnormal condition is decided." From these statements it can be seen that a sampling of the hydraulic pressure levels in the accumulator must take place in order to detect an abnormal condition therein during operation of the vehicle.

Ishii does discuss calculating a pressure gradient as discussed at the bottom of column 8, column 10 lines 10-15 and column 11 lines 49-54 and that the "abnormal condition" is determined only when it has been detected several times. This is to avoid an incorrect determination of an abnormal condition. Note that the timer begins when the switch is turned on, col. 13 lines 54-58. If the abnormal condition is detected the maximum speed of the vehicle is limited, col. 23 lines 24+. It therefore appears that the brake pressure monitoring system of Ishii functions during operation of the vehicle.

Although presumed to be inherent in Ishii, lacking is a specific discussion of using a pressure limit, or threshold value, to generate a fault signal. Also lacking is a discussion of measuring the pressure of the hydraulic braking fluid and using this measure pressure value to determine the "pre-charge" pressure of the gas in the gas (chamber) of the accumulator.

The reference to Nitta et al. (see prior art discussion in columns 1 and 2) teaches the notoriously well known idea of using continuously detected accumulator hydraulic pressures compared to target or predetermined pressure levels within the accumulator to determine accumulator malfunction. This reference is relied upon primarily for background art.

The reference to Nakamura et al. discloses a system using a number of different methods for diagnosing leakage problems in an accumulator. For instance Nakamura et al. teaches the known idea of using either the hydraulic pressure or the gas pressure in the accumulator to determine the working status of the accumulator. See the discussion in columns 1 and 2, but particularly lines 58-61 of col. 2. See also col. 4 lines 50-55 and note Nakamura et al. uses sensors in **both** the accumulator chamber and the gas chamber to detect pressure levels. In column 7 lines 41-49 Nakumura et al. states: "*In the accumulator diagnosing apparatus according to the above mode (13), the accumulator may be diagnosed after the electric motor of the pump device has been held in the off state for more than a predetermined time, when the electric motor is switched from the off state to the on state, or when a main switch for turning on the high-pressure source or a main switch (e.g., **an ignition switch**) provided on the automotive vehicle is switched from the off state to the on state...*".

It is noted that at page 4 of appellant's disclosure that the pressure detection device may be coupled to either the gas or hydraulic chambers of the accumulator. Therefore there is no specific requirement that the pressure of the hydraulic fluid in the accumulator must be measured to produce the claimed output signal to determine the

"precharge" gas pressure. It is also noted that appellant's pressure sampling of the charge pressures in the accumulator begins when a signal from the power source indicates the vehicles RPM'S have reached a predetermined limit—signifying a start of the motor vehicle. This diagnostic method is similar to that taught in Nakamura et al.

It would have been obvious to have incorporated the teachings of Nakamura et al. and Nitta et al. into the device of Ishii as an obvious alternative means of detecting an abnormal pressure level in the accumulator. Appellant's method of getting a measurement of a "precharge pressure", in turn, is simply an obvious variation of these combined teachings of detecting possible leakage, or failure, of the accumulator, since Ishii as modified by Nakumura is capable of determining such a pre-charge pressure within the accumulator once the vehicle is started.

Regarding claims 15-17,21-22 these requirements are met by the combined teachings above.

3. Claims 18,20,23-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishii, as modified above, and further in view of Holst et al. ('311) or Inagawa et al. and further in view of Sekigawa et al. or Harris et al.

Ishii, as modified, lacks a specific discussion of sampling the output signal of the pressure detection device 11 at pre-determined intervals during operation of the vehicle.

The reference to Holst et al. '311 is more specific in this regard (and possible redundant) but is relied upon to show it is well known in the art to "sample the output signal" from a pressure sensor for adjustment of the brake pressure in a brake cylinder. See columns 1 and 2.

The same reasoning is applied to the reference to Inagawa et al. Although not specifically using the term "sampling" effectively meets applicants claimed limitation in cols 7 and 8. Note the pressure detector 11 detects the liquid pressure in the accumulator 10. And with respect to the limitations of claim 18 see col 5 lines 40+ over to col. 6.

One having ordinary skill in the art at the time of the invention would have found it obvious to have continuously "sampled" the signal from the pressure sensor 11 in Ishii et al. at predetermined time intervals and to have compared these values to threshold values stored in the ECU 13 simply as an alternative equivalent method of determining an accurate abnormal pressure condition in the accumulator or system of Ishii et al. and controlling the cut-in and cut-out times of the pump should the accumulator develop a leak. Note figures 3a and 3b of Ishii et al.

Note also that the monitoring apparatus of Ishii starts when the ignition switch is turned on. See column 13 lines 54-57 of Ishii.

Regarding claim 25 Ishii in view of Holst or Inagawa et al. are relied upon as above. Most accumulators in the art use a "precharge gas" in one of the chambers. Note element 7 in figure 1 where the accumulator is separated into two chambers - one of which appearing to be charged with gas. Notwithstanding the argument, the device of Sekigawa et al. or Harris et al. are relied upon to teach it is known to preload the accumulators as well as for their teaching of the pressure sensitive valves and cut-in and cut-out pressures to regulate fluid pressures within the accumulator to predetermined desired levels.

The references to Holst, Inagawa et al., Sekigawa et al. or Harris et al come closer to appellant's choice of claimed terminologies of "cut-in pressure", "sampling" and "precharge" or preload accumulator pressure. They serve mainly to illustrate that such limitations are known in the art, and from their description therefrom, show that these limitations are probably inherent in the primary references to Ishii and Nakamura et al.

One having ordinary skill in the art at the time of the invention would have found it obvious to have incorporated the teachings of either Sekigawa et al. or Harris et al. into the device of Ishii, as modified above, to regulate fluid pressure within the accumulator dependent upon such predetermined vehicle operating functions as (ABS, TC, VSC etc.).

(10) Response to Argument

Appellant's explain on page 14 of their arguments section that "Measuring the pre-charge pressure of the gas [in the accumulator] is not the same as measuring the pressure of the gas in the accumulator at any state.".

The examiner understands this. The reference to Ishii teaches that the pressure in the hydraulic portion of the accumulator can be measured by a pressure sensor 11 (see figure 1) and that if a pressure gradient comparison means 24 determines that there is a rise or drop in pressure that exceeds a predetermined value (and sequentially for a predetermined number of times—see the abstract) then the abnormal condition detecting means 28,29 generates an alarm signal. See the bottom of col.8 over to column 9 lines 1-25.

Nakumura is relied upon to show a similar malfunction accumulator detection device. Nakumura states that the accumulator "*can be diagnosed on the basis of at least **one of** the fluid pressure in the accumulator chamber **and** the gas pressure in the gas chamber*" – col. 2 lines 58-61) and "*...may be diagnosed to be defective if the detected fluid pressure or gas pressure in the accumulator chamber, or gas chamber, is lower than a predetermined threshold.*"—col. 4 lines 52-55. In column 7 lines 41-49 Nakumura et al. states: "*In the accumulator diagnosing apparatus according to the above mode (13), the accumulator may be diagnosed after the electric motor of the pump device has been held in the off state for more than a predetermined time, when the electric motor is switched from the off state to the on state, **or** when a main switch for turning on the high-pressure source or a main switch (e.g., **an ignition switch**) provided on the automotive vehicle is switched from the off state to the on state...*".

With respect to appellant's independent structural claims 1,21 and 30, Ishii as modified is certainly capable of meeting the claimed limitations since the structure is the same and Nakamura clearly teaches that the pressure in the gas chamber of the accumulator can be used to determine a malfunction.

While not specifically using appellant's claimed terminology of a "precharge" pressure, the reference to Nakamura clearly suggests in the passages cited above that such a reading could readily be determined in Ishii and then compared to predetermined values to determine possible leakage of the accumulator.

With respect to appellant's method claim 10 appellant's claim that they "monitor" the brake fluid pressure in the brake system by measuring the pressure of the hydraulic

brake fluid to get an estimate of the accumulator "pre-charge" pressure. This pressure is then compared to an "ideal value".

Ishii, as modified by Nakamura, teach a system for measuring the pressure gradient in an accumulator (a pressure somewhere within the accumulator must inherently be determined first) and comparing this gradient loss or increase with a predetermined value (a predetermined number of times) to produce an alarm signaling malfunction of the accumulator. See the abstract of Ishii. Nakamura et al. teaches that the gas pressure in the accumulator can alternatively be used. Nakamura further states that *), the accumulator may be diagnosed after the electric motor of the pump device has been held in the off state for more than a predetermined time, when the electric motor is switched from the off state to the on state,* ***or*** *when a main switch for turning on the high-pressure source or a main switch (e.g.,* ***an ignition switch****) provided on the automotive vehicle is switched from the off state to the on state...".*

Ishii, as modified by Nakamura, shows that it therefore becomes only an obvious matter of timing of when the pressure in the accumulator is measured, which could be the pre-charge pressure, to determine whether or not a fault exists.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Christopher P. Schwartz

Conferees:

Rob Siconolfi

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CHRISTOPHER P. SCHWARTZ
PRIMARY EXAMINER